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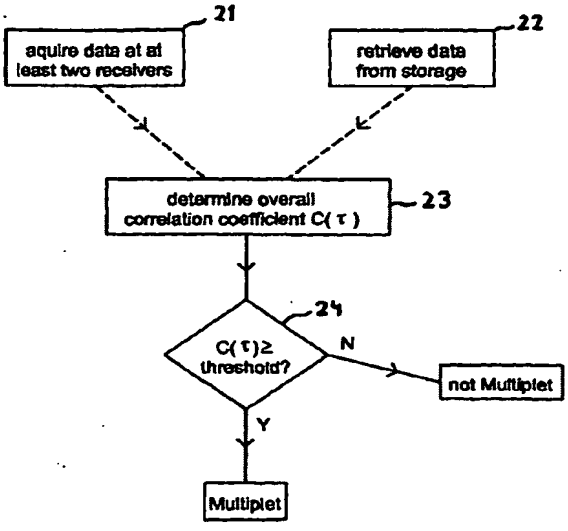
(54) Title: PASSIVE SEISMIC EVENT DETECTION



(57) Abstract: A method of identifying passive seismic events in seismic data that contains at least first seismic data traces acquired at a first seismic receiver and second seismic data traces acquired at a second receiver spatially separated from the first receiver comprises determining an overall measure of similarity for a pair of events in the seismic traces. The overall measure of similarity is indicative of similarity between the events acquired at the first seismic receiver and of similarity between the events acquired at the second seismic receiver. In one method, the overall measure of similarity is an overall cross-correlation coefficient. The overall cross-correlation coefficient is found by determining a first correlation coefficient for the pair of events from the data acquired at the first receiver and determining a second correlation coefficient for the pair of events from the data acquired at the second receiver. The overall correlation coefficient for the pair of events may be obtained from the first correlation coefficient and the second correlation coefficient by an averaging process. The overall measure of similarity may be compared with a threshold to determine whether the pair of events form a doublet. The method makes possible real-time or near-real-time identification of doublets.

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